NEPA Call-In
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FACT SHEET

September 1997

Floods and Flood Hazards

An Overview of Floods

Flooding is a natural phenomenon, occurring periodically when rain or melting snow causes rivers to rise and streams and lakes to overflow their banks onto adjacent land areas. Flooding can also occur in coastal areas subject to inundation by tidal floods. Although the risk of flooding varies from place to place, almost all areas of the United States (U.S.) are subject to some kind of flooding when the right set of circumstances occur. Seven to nine percent of the U.S., or 150,000 square miles, is flood prone, and six to eight million buildings are located in these flood prone areas. According to the Federal Interagency Floodplain Management Task Force, "the rate of urban growth in floodplains is about twice that of the rest of the country. Although the average annual loss of life from floods appears to have been stabilized, annual flood losses [property] continue to rise."

All floods cannot be predicted; however, past flooding gives some clues about what to expect. This fact sheet provides an overview of floodplains, floodplain laws and regulations, and the determination of flood risk.

Floodplains

Most floodplains are adjacent to streams, lakes, or oceans although almost any area can flood under the right conditions. Beaches and small river valleys are usually easily recognizable as floodplains, but less obvious floodplains occur in dry washes and on alluvial fans in arid parts of the western U.S., around prairie potholes, in areas subject to high groundwater levels, and in low lying areas where water may accumulate. Sheet flooding and ponding occurs in areas where there is no clearly defined channel and the path of flooding is unpredictable.

Floodplains are designated by the frequency of the flood that can be conveyed within them. For example, the 100-year floodplain is the land that is covered by a 100-year flood. A 100-year flood is the flood that has a one percent chance of occurring in any given year. An infinite number of 100-year floods can occur at any location each year. Likewise, the 500-year floodplain is the land covered by a 500-year flood. The 500-year flood has a 0.2 percent chance of occurring in any given year. The actual height of a given flood (100-year, 500-year, etc.) can vary greatly from one geographical location to the next. The National Flood Insurance Act of 1968 required the Federal Insurance Administration (FIA) to identify all floodplain areas within the U.S., and establish flood-risk zones within those areas. Most of the known floodplains in the U.S. have been mapped by the FIA, which is a Directorate within the Federal Emergency Management Agency (FEMA). FEMA's mission is "to reduce the loss of life and property and protect our nation's critical infrastructure from all types of hazards, through a comprehensive, risk-based emergency management program of mitigation, preparedness, response, and recovery." FEMA works with government and professional groups to reduce the effects of floods by:

- Encouraging property owners to elevate structures above flood level,
- Promoting sound building design and construction,
- Providing grants for flood-reducing activities,
- Educating the public about floods and flood hazards,
- Helping communities adopt floodplain ordinances,
- Relocating homes and businesses away from high risk areas, and
- Developing risk assessment maps.

What's Inside . . .

Floodplain Laws and Regulations

GSA employees receive floodplain guidance from Federal laws and regulations, Executive Orders (EOs), and GSA policy. The following is a summary of laws and guidance which directs GSA personnel in floodplain decisions.

Federal Policy

National Flood Insurance Act of 1968—In 1968 Congress realized that virtually no insurance was available in the private sector to protect against the peril of flooding. In recognition of this and the fact that 70-80 percent of all disasters in the United States are flood events, the National Flood Insurance Act of 1968 was enacted to create institutions designed to help property owners protect themselves from losses due to flooding. The Act requires the identification of all floodplain areas within the U. S. and the establishment of flood-risk zones within those areas, and directed the FIA to conduct these studies. As a result of these ongoing studies Flood Insurance Rate Maps (FIRMs), which delineate areas of flood hazard, were created for many U.S. communities. These maps show the location of areas of special flood hazard and applicable risk premium zones. Flood Hazard Boundary Maps (FHBMs) were also created to identify areas of flood hazard based on approximate methods.

A Flood Insurance Study (FIS) includes much more data than FIRMs and FHBMs. Data within the FIS can help communities make sound development decisions. Information provided by the FIS, such as flood profiles, velocities, and cross-sectional data can enable communities to adopt or amend floodplain management measures. An FIS also provides the information necessary to establish and maintain flood insurance premiums.

The Act also created the National Flood Insurance Program (NFIP), which is administered by the FIA. The National Flood Insurance Act of 1968 is included in Title XIII of the Housing and Urban Development Act of 1968, as amended.

National Flood Insurance Program—The NFIP, Title 24 Code of Federal Regulations (CFR) Part 1909, was created to help prevent losses to property owners due to floods. NFIP makes Federal flood insurance available to property owners who live in communities who comply with local ordinances designed to mitigate flooding losses. Insurance rates are based upon the flood probabilities determined by FIRMs. The eligibility for purchase of flood insurance is dependent on community agreement to adopt ordinances to mitigate the impact of future flooding. As a result, the Federal government was able to make flood insurance available, while avoiding the possible incentives the program could provide for unwise floodplain development if floodplain ordinances were not required. Ordinances may include elevation of the lowest floor of structures above the 100-year base flood level for a given community. To find out if a community is participating in the NFIP, contact the local building officials, insurance agents, or the NFIP customer line at (800) 638-6620. Also, each participating community has a designated Floodplain Administrator.

National Flood Insurance Reform Act of 1994—The National Flood Insurance Reform Act, a 1994 amendment to the National Flood Insurance Act, created an interagency task force known as the Flood Insurance Task Force (Task Force). The Task Force, made up of designees from ten Federal agencies and organizations, makes recommendations concerning the establishment and adoption of standardized enforcement procedures under the NFIP. The Task Force is also directed to conduct studies of (1) the fees charged under the Flood Disaster Protection Act, (2) the extent to which Federal agencies and the secondary mortgage market can provide assistance in NFIP compliance, and (3) the extent to which existing NFIP programs of Federal agencies and corporations can serve as a model for other Federal agencies. Lastly, the Task Force is directed to develop recommendations concerning enforcement and compliance procedures based on these studies.

Flood Disaster Protection Act of 1973—Before the adoption of the Flood Disaster Protection Act, the purchase of flood insurance was voluntary. Major flooding disasters in 1972 caused extensive losses to Federally funded structures that did not voluntarily purchase flood insurance under the NFIP. Because of this, the Flood Disaster Protection Act requires the purchase of flood insurance for buildings acquired or constructed in special flood hazard areas with grants or other Federal assistance such as FHA mortgages. Special flood hazard areas are those areas within the 100-year base floodplains.

Executive Order (EO) 11988, "Floodplain Management," May 24, 1977—EO 11988 seeks to avoid the long and short-term adverse impacts associated with the occupancy and modification of floodplains, and to avoid direct or indirect support of floodplain development wherever there is a practicable alternative. EO 11988 applies to Federally funded projects and directs agencies to consider alternatives to siting in a floodplain. EO 11988 applies to development in the 100-year floodplain as well as critical actions in the 500-year floodplain.

A critical action is defined by the Water Resources Council Floodplain Management Guidelines as any activity for which even a slight chance of flooding is too great. For example, if an action would create an added dimension to the flood, as would be the case for facilities producing or storing volatile or toxic materials, or if the occupants of a building located in the floodplain (hospitals, schools) were not sufficiently mobile to evacuate the area in the event of a flood, the action would be a critical one. The loss of irreplaceable records, emergency services or a time-sensitive judiciary action would also be considered critical actions.

Critical actions reflect the concern that the impacts of floods on human safety, health, and welfare for many activities sometimes cannot be minimized unless a higher degree of protection than the 100-year floodplain is provided. Activities determined to be critical actions, such as the function of the U.S. Courts, are subject to a higher standard—the 500-year flood.

Practicable alternatives to siting in a floodplain can include carrying out the proposed action outside of the floodplain, accomplishing the same objective using other means, or taking no action at all. Alternative sites within the floodplain need to be evaluated if there are no practicable sites outside the floodplain. Finally, the floodplain location itself must be shown to be practicable before the action can be taken, and the need to select a floodplain location must be clearly demonstrated. If it is determined there is no practicable alternative to siting in a floodplain, accepted flood proofing and other flood protection measures shall be applied to new construction or rehabilitation. To achieve flood protection, agencies shall, among other methods, elevate structures above the base flood level rather than filling in land. According to ADM 1095.2, elevation shall be "accomplished by the use of open work, for example, columns, walls, piles, or piers."

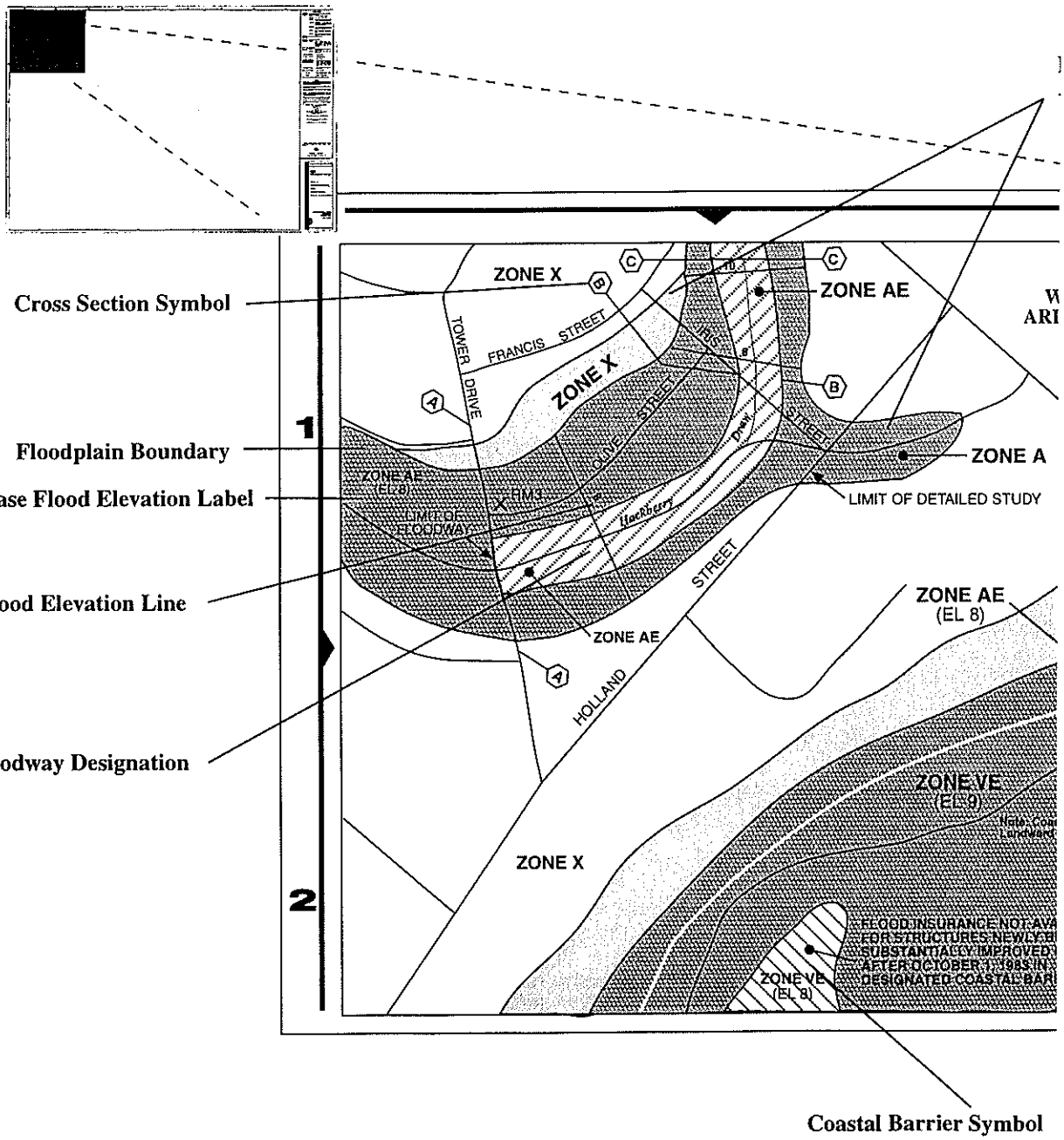
Guidelines for determining no practicable alternative and critical actions are included in the FEMA publication, "Further Advise on Executive Order 11988 Floodplain Management." This publication is available from NEPA Call-In or by contacting the FEMA publications center (800) 480-2520.

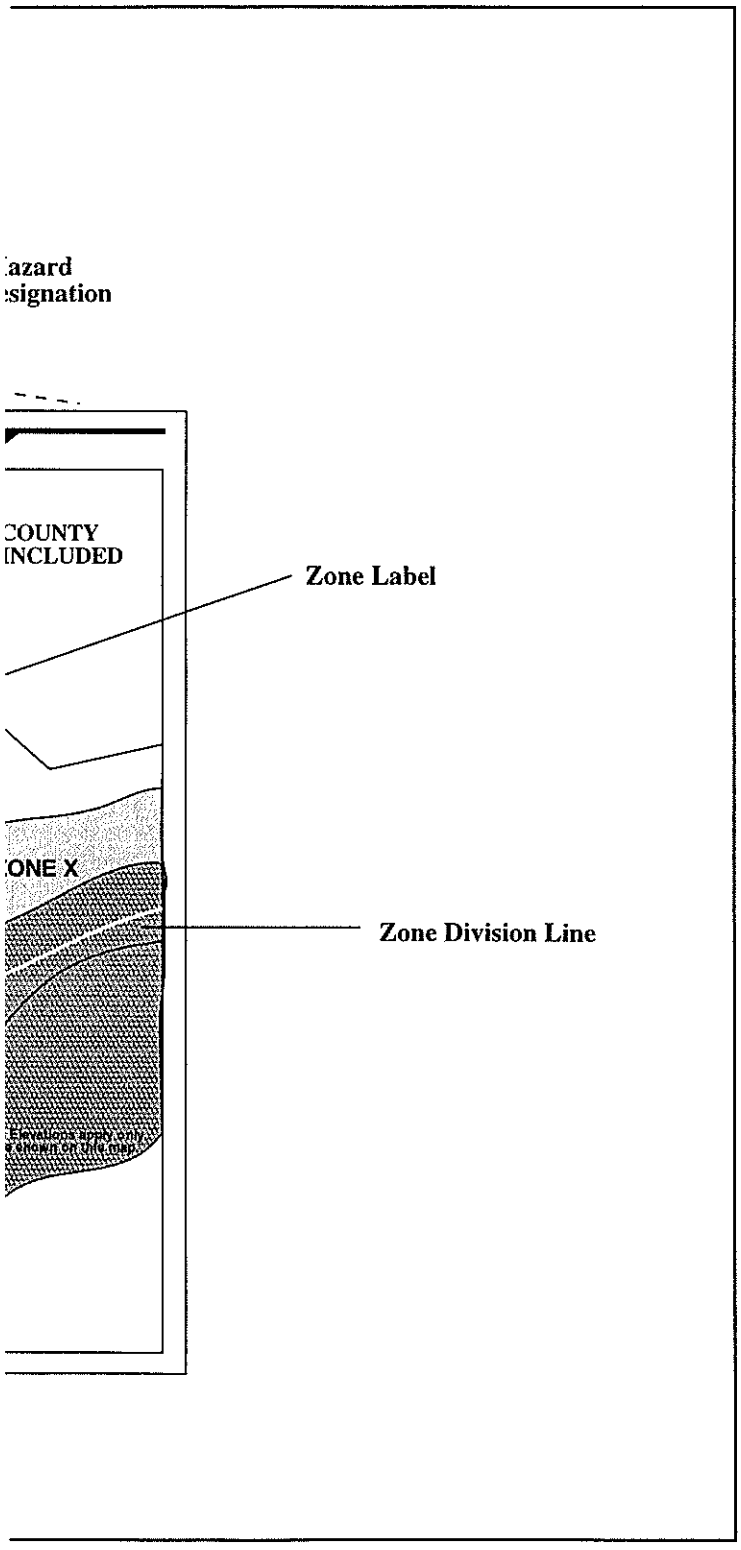
GSA ADM 1095.2, "Consideration of Floodplains and Wetlands in Decisionmaking," October 31, 1983—ADM 1095.2 contains GSA policy for the implementation of EO 11988. The intent of this guidance document is to (1) minimize the impact of floods on human safety, health and welfare, (2) minimize the destruction, loss, or degradation of wetlands, (3) preserve and restore the nature and beneficial values of floodplains and wetlands, (4) reduce the risk of flood loss, (5) develop procedures to involve the public in the floodplain management and wetland protection decisionmaking process, and (6) incorporate the Unified National Program for Floodplain Management into agency programs. GSA ADM 1095.2 outlines the GSA decisionmaking process, which must be followed when floodplains or wetlands are involved.

Executive Order 13006, "Locating Federal Facilities on Historic Properties in Our Nation's Central Cities," May 21, 1996—EO 13006 directs Federal agencies to give first consideration to historic properties in historic districts when locating Federal facilities. If no such property is suitable, the agencies are directed to consider other developed or undeveloped sites within historic districts. EO 13006 is subject to the requirements of EO 12072, "Federal Space Management," which requires first consideration to centralized community business areas when meeting Federal space needs except where it is otherwise prohibited. EO 13006 also directs Federal agencies responsible for Federal facilities to take steps to reform, streamline, and minimize regulations, policies, and procedures that impede the Federal Government's ability to establish or maintain a presence in historic districts or to acquire historic properties to satisfy Federal space needs.

EO 13006 is not intended to conflict with EO 11988; rather, the intent of EO 13006 is to first consider historic central city areas for property actions. If this area is in a flood hazard area, then guidance in EO 11988 must be followed. If the floodplain location is determined to be the only practicable alternative, then the action will proceed in the historic central city area.

How To Read the Body of a Flood Map





The above policies and guidance are designed to minimize the threat to human health, losses due to flooding, and adverse impacts on the floodplain and environment. This is accomplished through mitigation of the flooding impact by means of floodproofing new and existing structures in accordance with the NFIP. Several documents are available from FEMA and U. S. Army Corps of Engineers, which provide information on floodproofing and floodplain management to meet regulatory compliance. These documents are available by contacting NEPA Call-In, FEMA, or the local U.S. Army Corps of Engineers (USACE) office.

Determining Flood Risk

Floodplain Hazards

Engineers studying past floods use statistics to estimate the chance that floods of various sizes will occur.

A flood which occurs on average once in every hundred years has a one percent chance of occurring in any particular year. These floods are called 100-year floods or 1- percent chance floods. A 100-year flood does not mean a flood of that magnitude happens once in a hundred years, but that there is a one percent chance a flood of that magnitude will occur in any given year. Therefore, a 100-year flood could occur more than once in 100 years, or more than once in any year, as this determination refers to the chance (1 percent) a flood of that magnitude would occur. The 100-year flood is the regulatory standard used by the NFIP as the basis for insurance requirements nationwide. Areas within 100-year flood boundaries are termed Special Flood Hazard Areas, areas between the 100 and 500-year floodplain boundaries are termed Areas of Moderate Flood Hazard, and remaining areas above the 500-year floodplain are termed Areas of Minimal Flood Hazard. Each floodplain or special flood hazard area is divided into flood insurance rate zones based on the floodplain boundaries determined in an FIS:

Zone A—Corresponds to special flood hazard areas determined by approximate methods. There are no base flood elevations (BFEs) shown because no detailed hydraulic analyses have been performed. BFEs, usually expressed in feet, represent 100-year flood elevations (the height of the 100-year flood), and are determined by specific data, usually the National Geodetic Vertical Datum of 1929 or North American Vertical Datum of 1988.

Zone AE—Corresponds to special flood hazard areas determined by detailed methods. In most cases, BFEs are shown.

Zone AO—Corresponds to special flood hazard areas where shallow flooding (usually sheet flow) results in average flood depths between 1 and 3 feet. BFEs are not determined.

Zone AH—Corresponds to special flood hazard areas where shallow flooding or ponding results in average depths between 1 and 3 feet. BFEs have been determined and are shown.

Zone A99—Corresponds to special flood hazard areas where enough progress has been made on a protective system, such as dikes, dams, and levees, to consider it complete for insurance rating purposes.
No BFEs are shown.

Zone AR—Corresponds to special flood hazard areas that have been decertified from a previously accredited flood protection system, and are in the process of being restored to provide 100-year or greater level of flood protection.

Zone V—Corresponds to special flood hazard areas that have additional hazards associated with storm waves (coastal floodplains). Tidal floods often inundate these areas. No detailed hydraulic analyses have been performed; therefore no BFEs are shown.

Zone VE—Corresponds to special flood hazard areas having additional hazards associated with storm waves, where detailed hydraulic analyses have been performed and BFEs are shown.

Zone X—Corresponds to (1) areas outside the 100-year floodplain, (2) areas of 100-year sheet flow flooding where average depths are less than 1 foot, (3) areas of 100-year stream flooding where the contributing drainage area is less than 1 square mile, or (4) areas protected from the 100-year flood by levees. No BFEs are shown.

Floodplain Determination

Where to get Flood Insurance Rate Maps (FIRMs)—GSA personnel should consult the FIRMs published by FEMA to investigate the flood hazard potential of a property. These maps can be obtained by contacting FEMA's Map Service Center or NEPA Call-In.

Federal Emergency Management Agency
Map Service Center
6730 Santa Barbara Court
Baltimore, MD 21227-5623
Phone: (800) 358-9616

It is possible that the area in question may not have a FIRM or the FIRM may not show all flood hazard areas. In this case GSA personnel should determine what other flood hazard information is available. Other sources of information include the local building official; the State NFIP coordinating agency; development districts; regional councils of government or planning agencies; flood control commissions; and Federal agencies such as FEMA, Soil Conservation Service, Army Corps of Engineers, and the Tennessee Valley Authority. Do not consider lack of information on a map or the lack of maps to mean there is no flood hazard.

How to read FIRMS—The following types of information can be found on a FIRM:

- Major highways, secondary roads, railroads, lakes, streams, waterways and other common physical features,
- Special Flood Hazard Areas,
- Base (100-year) flood elevations,
- Flood insurance risk zones, and
- 500-year flood areas.

GSA personnel can use the information in FIRMS to identify the location of a specific property in relation to the Special Flood Hazard Areas, and to determine the applicable flood insurance risk zone and the base flood elevation of the property. NEPA Call-In or USACE staff can help GSA personnel locate the appropriate index and panel maps for the property. There are five easy steps for locating floodplain information about a specific property:

STEP 1: Find the correct panel map by referring to the index map.

STEP 2: Find the general location of the property. Because FIRMS generally only include major roads and roads in or near floodprone areas, it may be helpful to also refer to another type of map such as a city map or highway department map.

STEP 3: Using the FIRM map scale and the legal description of the property, find the specific location of the property. Again, refer to a city or highway department map to confirm the specific location of the property.

STEP 4: Identify the flood insurance risk zone designation. Special Flood Hazard Areas appear as dark shaded areas on the FIRM. Light tinted areas are Zone X, and areas without tint are Zone X or Zone D. If the property under consideration and any part of the building on that property are in the Special Flood Hazard Area, the entire building is considered to be in the Special Flood Hazard Area. The insurance risk zone can then be identified by finding the appropriate zone label.

STEP 5: Identify the base flood elevation at the property. Base flood elevations are usually expressed in feet and are found in each zone. Wavy lines indicate that the base flood elevation varies. When the base flood elevation is constant across an area, wavy lines are not used. CAUTION: A particular structure may be shown to be within the 100-year floodplain, but a survey of the finished floor elevation could show the structure to be above the BFE.

The above mentioned steps have been summarized from "How to Use a Flood Map to Determine Flood Risk for a Property," FEMA, May 1995. This publication is available from NEPA Call-In or the FEMA publications office.

FEMA Regional Offices

FEMA offers workshops to provide guidance on floodplain hazards and their implications with respect to development. For information on the availability and scheduling of workshops in your area, contact your FEMA Regional Office:

Region I
Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont
FEMA Region I
J.W. McCormack Post Office and
Courthouse Building, Room 462
Boston, MA 02109-4595
Phone: (617) 223-9559

Region II
New Jersey, New York, Puerto Rico, and the Virgin Islands
FEMA Region II
26 Federal Plaza
13th Floor, Room 1337
New York, NY 10278-0002
Phone: (212) 225-7200

Region III
Delaware, District of Colombia, Maryland, Pennsylvania, Virginia, and West Virginia
FEMA Region III
Liberty Square Building
105 South Seventh Street
Second Floor
Philadelphia, PA 19106-3316
Phone: (215) 931-5512

Region IV
Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, and Tennessee
FEMA Region IV
3003 Chamblee-Tucker Road
Atlanta, GA 30341
Phone: (770) 220-5200

Region V
Illinois, Indiana, Michigan, Minnesota, Ohio, and Wisconsin
FEMA Region V
175 West Jackson Boulevard
Fourth Floor
Chicago, IL 60604-2698
Phone: (312) 408-5200

Region VI
Arkansas, Louisiana, New Mexico, Oklahoma, and Texas
FEMA Region VI
Federal Regional Center
800 North Loop 288
Denton, TX 76201-3698
Phone: (817) 898-5127

Region VII
Iowa, Kansas, Missouri, and Nebraska
FEMA Region VII
2323 Grand Boulevard
Suite 900
Kansas City, MO 64108-2670
Phone: (816) 283-7002

Region VIII
Colorado, Montana, North Dakota, South Dakota, Utah, and Wyoming
FEMA Region VIII
Denver Federal Center
Building 710
Box 25267
Denver, CO 80225-0267
Phone: (303) 235-4830

Region IX
Arizona, California, Hawaii, Nevada, Guam, American Samoa, and the Mariana Islands
FEMA Region IX
Presidio of San Francisco
Building 105
San Francisco, CA 94129-7250
Phone: (415) 923-7177

Region X
Alaska, Idaho, Oregon, and Washington
FEMA Region X
Federal Regional Center
130 228th Street SW
Bothell, WA 98021-9796
Phone: (206) 487-4682

References

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EO 13006, "Locating Federal Facilities on Historic Properties in Our Nation's Central Cities," May 21, 1996.

"The Floodplain Management Web Site," http://floodplain.org/.

"Flood Prone Property: A Guide for the Real Estate Professional," Tennessee Valley Authority, June 1990.

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"Guidelines and Specifications for Study Contractors," FEMA, January 1995.

"How to Use a Flood Map to Determine Flood Risk for a Property," FEMA 258, May 1988.

"Mandatory Purchase of Flood Insurance Guidelines," FEMA, October 1989.

National Flood Insurance Reform Act of 1994, "This is FEMA," FEMA, 1996.

"A Unified National Program for Floodplain Management 1994," Federal Interagency Floodplain Management Task Force.

NEPA Call-In is GSA's National Environmental Policy Act (NEPA) information clearinghouse and research service. NEPA Call-In is designed to meet the NEPA compliance needs of GSA's realty professionals.

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